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DLF/DLH1236 V2

1000nits 12.1” LED B/L LCD

User Manual

(1st Edition 2013/6/28)

All information is subject to change without notice.

Approved by	Checked by	Prepared by

LITEMAX Electronics Inc.
8F, No.137, Lane 235, Bau-chiau Rd.,
Shin-dian City, Taipei County, Taiwan R.O.C.
Tel : 886-2-8919-1858
Fax: 886-2-8919-1300
Homepage: http://www.litemax.com.tw

RECORD OF REVISION

Version and Date	Page	Old Description	New Description	Remark
Jun,28,2013	All		Initial Release	

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1.0 GENERAL DESCRIPTION

DLF/DLH1236 V2 is 12.1” wide color TFT-LCD module as active switching devices with 1000nits LED backlight powered by Durapixel™ technology. This module has a 12.1 inch diagonally measured active area with XGA resolutions (1024 horizontal by 768 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.2M colors.

1.1 FEATURES

- Brightness: 1000nits
- LED Backlight
- XGA(1024x768)
- High Shock & Vibration Resistance
- Low Power Consumption
- High Uniformity & Low EMI Noise
- Wide Temperature
- Life Expectancy

1.2 GENERAL SPECIFICATIONS

Model No.	**DLF1236 V2**	**DLH1236 V2**
Description	12.1” TFT LCD, LED Backlight ,1000nits,XGA(1024x768)	
Display Area (mm)	245.76(H) x 184.32(V)mm	
Brightness	1000 cd/m^2	
Resolution	1024x768 (XGA)	
Contrast Ratio	700 : 1	
Pixel Pitch (mm)	0.24(H) x 0.24(V)	
Viewing Angle	+80°~-80°(H), +70°~-70°(V)	
Display Colors	16.2M	
Response Time (Typical)	16ms	
Power Consumption	9.6W	11.6W
Dimensions (mm)	396x324.0x14.5mm	
Weight (Net)	0.55kg	0.6kg

1.3 ABSOLUTE MAXIMUM RATINGS

TFT LCD MODULE ELECTRICAL ABSOLUTE RATINGS

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	VCC	-0.3	7	V	(1)

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

ABSOLUTE RATINGS OF ENVIRONMENT

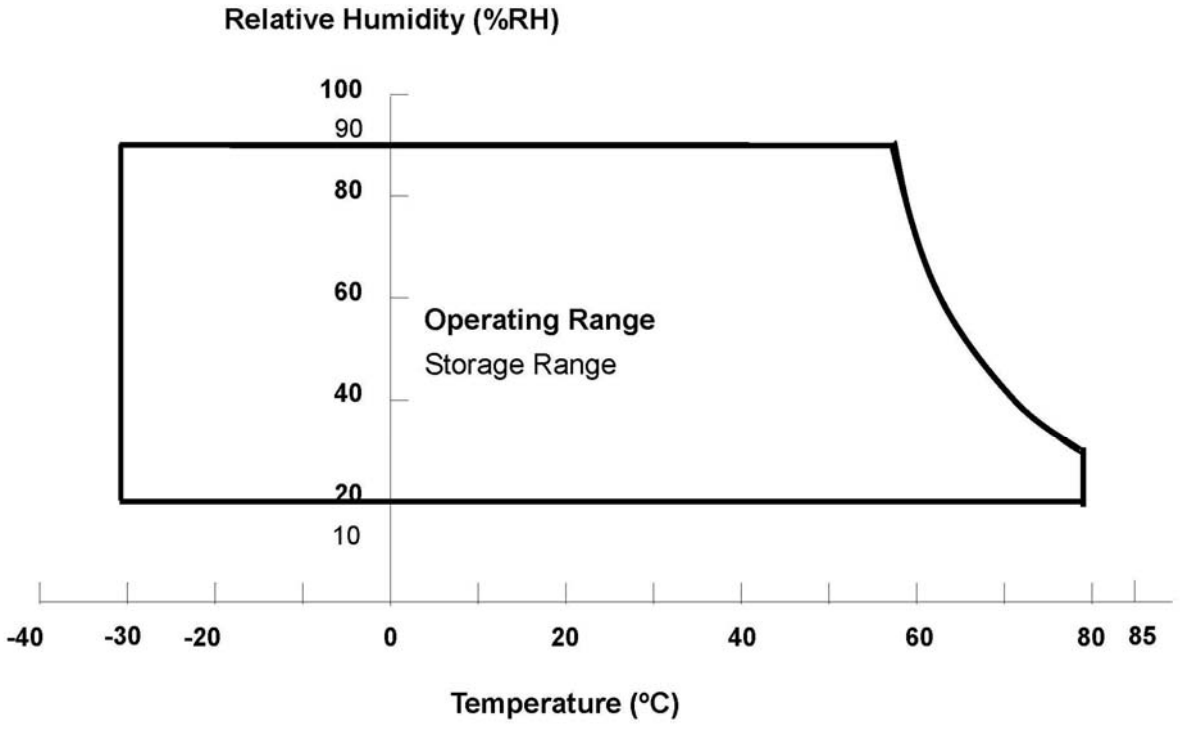
Item	Symbol	Value		Unit	Note
		Min.	Max.		
Operating Ambient Temperature	T_{OP}	-30	+80	ºC	
Storage Temperature	T_{ST}	-30	+80	ºC	

Note (1) Temperature and relative humidity range is shown in the figure below.

(2) 90 %RH Max. (Ta $\leq$ 40 ºC).

(3) Wet-bulb temperature should be 39 ºC Max. (Ta > 40 ºC).

(4) No condensation.



2.0 Panel Specification

ELECTRICAL CHARACTERISTICS

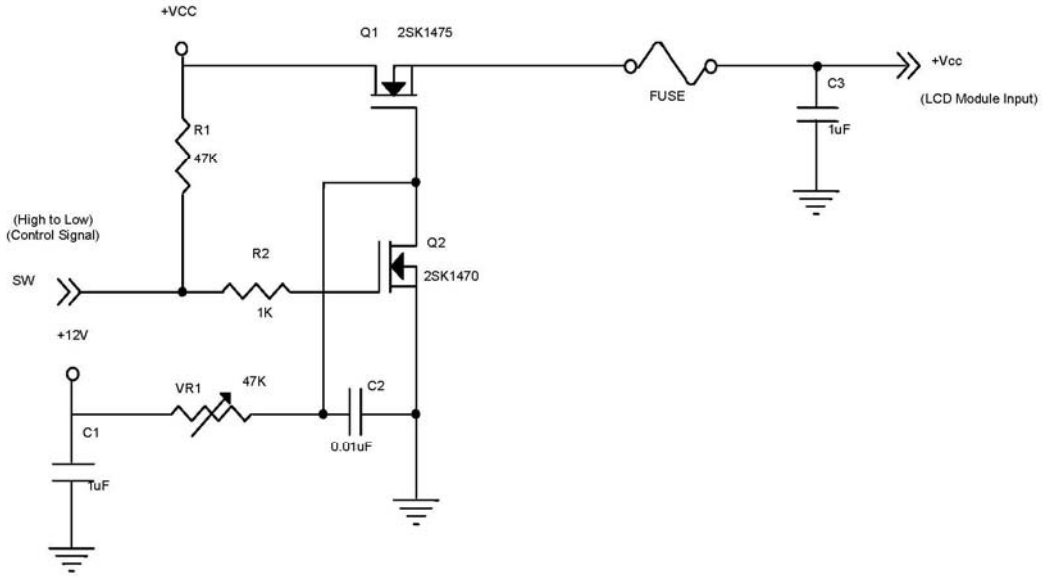
TFT LCD MODULE

Ta = 25 ± 2 ºC

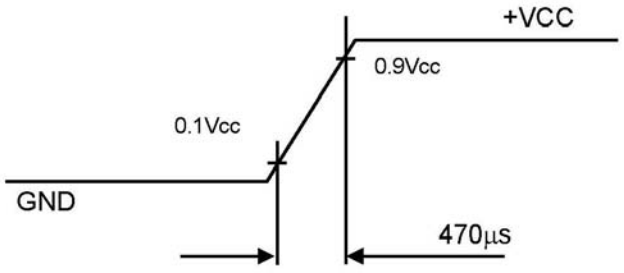
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V_{CC}	3.0	3.3	3.6	V	(1) at Vcc=3.3V
			4.75	5.0	5.25	V	(1) at Vcc=5.0V
Rush Current		I_{RUSH}	-	-	4	A	(2)
Power Supply Current	White	-	-	410	490	mA	(3)a, at Vcc=3.3V
			-	320	395	mA	(3)a, at Vcc=5.0V
	Black		-	540	650	mA	(3)b, at Vcc=3.3V
			-	400	480	mA	(3)b, at Vcc=5.0V
Power Consumption		P_L	-	2.0	-	W	
LVDS differential input voltage		|VID|	100	-	600	mV	
LVDS common input voltage		VICM	0.7	-	1.6	V	

Note (1) The assembly should be always operated within above ranges.

Note (2) Measurement Conditions:



Vcc rising time is 470μs



Note (3) The specified power supply current is under the conditions at Vcc = 3.3V or 5V, Ta = 25 ± 2 ºC, f_v = 60 Hz, whereas a power dissipation check pattern below is displayed.

a. White Pattern

Active Area

b. Black Pattern

Active Area

INPUT TERMINAL PIN ASSIGNMENT

TFT LCD MODULE

Pin	Name	Description	Remark
1	RX3+	Differential Data Input, CH3 (Positive)	
2	RX3-	Differential Data Input, CH3 (Negative)	
3	NC	NC	
4	SEL68	LVDS 6/8 bit select function control, Low or NC → 6 bit Input Mode High → 8bit Input Mode	Note (3)
5	GND	Ground	
6	RXC+	Differential Clock Input (Positive)	
7	RXC-	Differential Clock Input (Negative)	
8	GND	Ground	
9	RX2+	Differential Data Input , CH2 (Positive)	
10	RX2-	Differential Data Input , CH2 (Negative)	
11	GND	Ground	
12	RX1+	Differential Data Input , CH1 (Positive)	
13	RX1-	Differential Data Input, CH1 (Negative)	
14	GND	Ground	
15	RX0+	Differential Data Input, CH0 (Positive)	
16	RX0-	Differential Data Input, CH0 (Negative)	
17	reLR	Horizontal Reverse Scan Control, Low or NC → Normal Mode. High → Horizontal Reverse Scan	Note (3)
18	reUD	Vertical Reverse Scan Control, Low or NC → Normal Mode, High → Vertical Reverse Scan	Note (3)
19	VCC	Power supply	
20	VCC	Power supply	

Note (1) Connector Part No.: STARCONN 076B20-0048RA-G4 or JAE FI-SEB20P-HFE or equivalent.

Note (2) User's connector Part No.: JAE FI-SE20ME or equivalent.

Note (3) "Low" stands for 0V. "High" stands for 3.3V. "NC" stands for "No Connected".

COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 6-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																	
		Red						Green						Blue					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale Of Green	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Gray Scale Of Blue	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue(62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

Note (1) 0: Low Level Voltage, 1: High Level Voltage

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																							
		Red								Green								Blue							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale Of Green	Green(0)/ Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale Of Blue	Blue(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Note (1) 0: Low Level Voltage, 1: High Level Voltage

INPUT SIGNAL TIMING SPECIFICATIONS

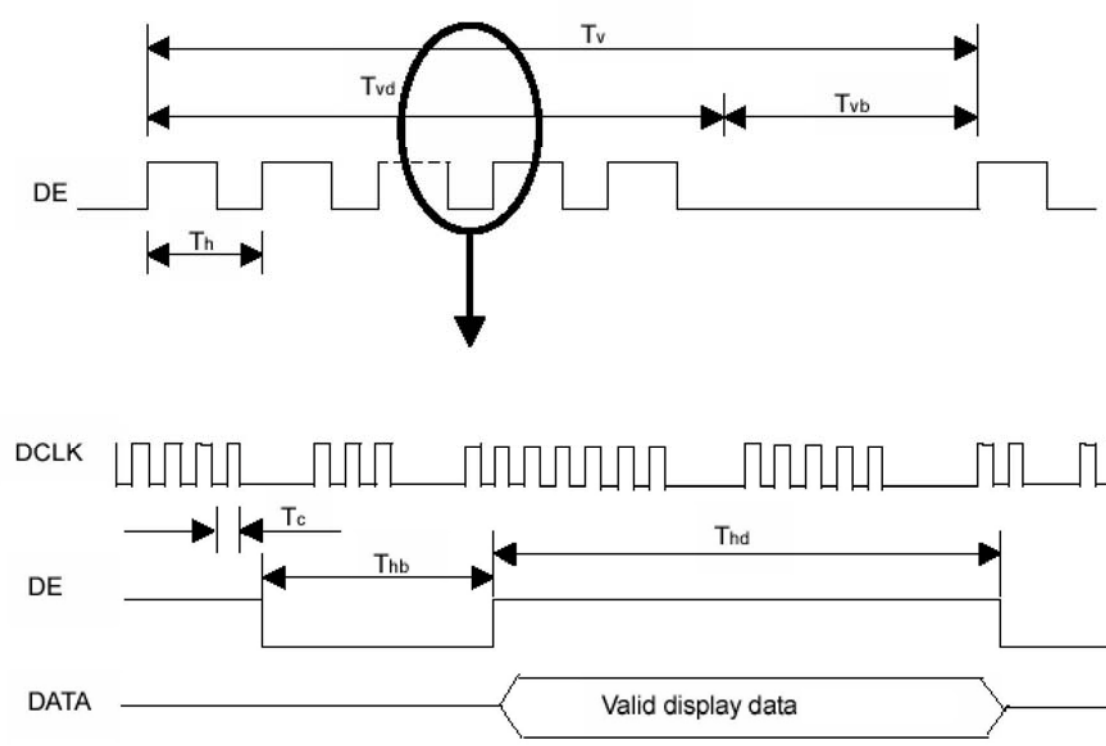
The input signal timing specifications are shown as the following table and timing diagram.

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	Fc	57.5	64.9	74.4	MHz	
Vertical Active Display Term	Total	Tv	774	806	848	Th	Tv=Tvd+Tvb
	Display	Tvd	-	768	-	Th	-
	Blank	Tvb	6	38	80	Th	-
Horizontal Active Display Term	Total	Th	1240	1344	1464	Tc	Th=Thd+Thb
	Display	Thd	-	1024	-	Tc	-
	Blank	Thb	216	320	440	Tc	-

Note (1) Since this assembly is operated in DE only mode, Hsync and Vsync input signals should be set to low logic level. Otherwise, this assembly would operate abnormally.

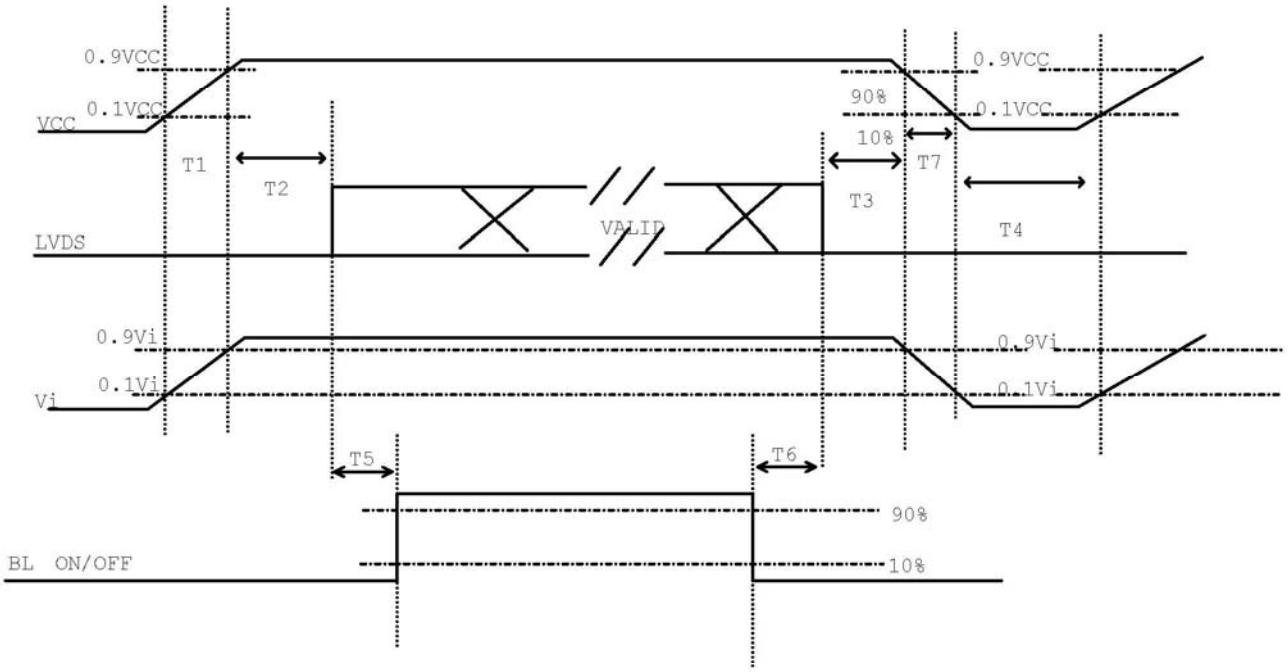
(2) Frame rate is 60Hz

INPUT SIGNAL TIMING DIAGRAM



POWER ON/OFF SEQUENCE

To prevent a latch-up or DC operation of LCD assembly, the power on/off sequence should be as the diagram below.



Power ON/OFF sequence

Note (1) Please avoid floating state of interface signal at invalid period.

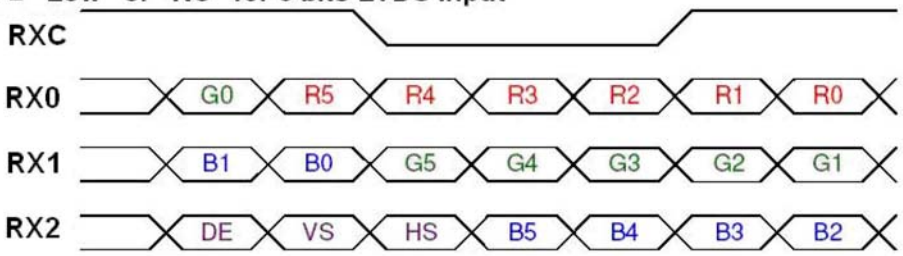
Note (2) When the interface signal is invalid, be sure to pull down the power supply of LCD VCC to 0 V.

Note (3) The Backlight converter power must be turned on after the power supply for the logic and the interface signal is valid. The Backlight converter power must be turned off before the power supply for the logic and the interface signal is invalid.

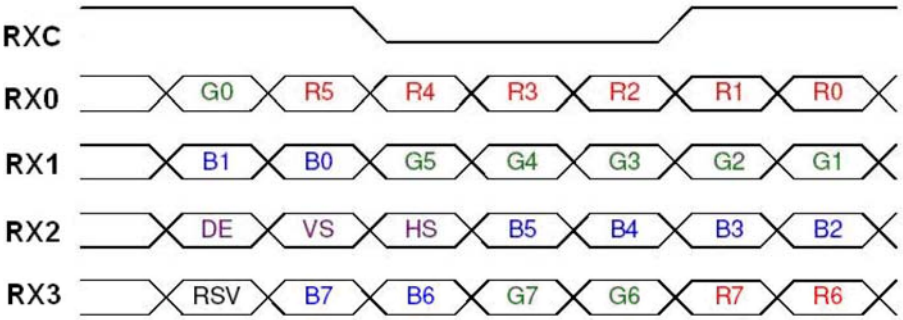
Parameter	Value			Units
	Min	Typ	Max	
T1	0.5	-	10	ms
T2	0	-	50	ms
T3	0	-	50	ms
T4	500	-	-	ms
T5	200	-	-	ms
T6	200	-	-	ms
T7	5	-	300	ms

The Input Data Format

SEL68 = "Low" or "NC" for 6 bits LVDS Input



SEL68 = "High" for 8 bits LVDS Input



Note (1) R/G/B data 7: MSB, R/G/B data 0: LSB

Note (2) Please follow PSWG

Signal Name	Description	Remark
R7	Red Data 7 (MSB)	Red-pixel Data
R6	Red Data 6	Each red pixel's brightness data consists of these
R5	Red Data 5	8 bits pixel data.
R4	Red Data 4	
R3	Red Data 3	
R2	Red Data 2	
R1	Red Data 1	
R0	Red Data 0 (LSB)	
G7	Green Data 7 (MSB)	Green-pixel Data
G6	GreenData 6	Each green pixel's brightness data consists of these
G5	GreenData 5	8 bits pixel data.
G4	GreenData 4	
G3	GreenData 3	
G2	GreenData 2	
G1	GreenData 1	
G0	GreenData 0 (LSB)	
B7	Blue Data 7 (MSB)	Blue-pixel Data
B6	Blue Data 6	Each blue pixel's brightness data consists of these
B5	Blue Data 5	8 bits pixel data.
B4	Blue Data 4	
B3	Blue Data 3	
B2	Blue Data 2	
B1	Blue Data 1	
B0	Blue Data 0 (LSB)	
RXCLKIN+ RXCLKIN-	LVDS Clock Input	
DE	Display Enable	
VS	Vertical Sync	
HS	Horizontal Sync	

Note (3) Output signals from any system shall be low or Hi-Z state when VCC is off.

Scanning Direction

The following figures show the image see from the front view. The arrow indicates the direction of scan.

Fig.1 Normal Scan

Fig.2 Reverse Scan

Fig.3 Reverse Scan

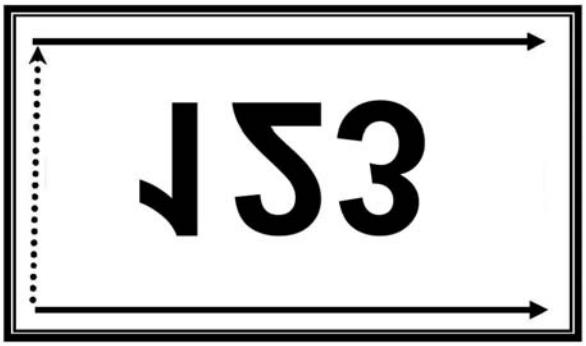


Fig.4 Reverse Scan

Fig. 1 Normal scan (pin 17, reLR = Low or NC, pin 18, reUD = Low or NC)

Fig. 2 Reverse scan (pin 17, reLR = High, pin 18, reUD = Low or NC)

Fig. 3 Reverse scan (pin 17, reLR = Low or NC, pin 18, reUD = High)

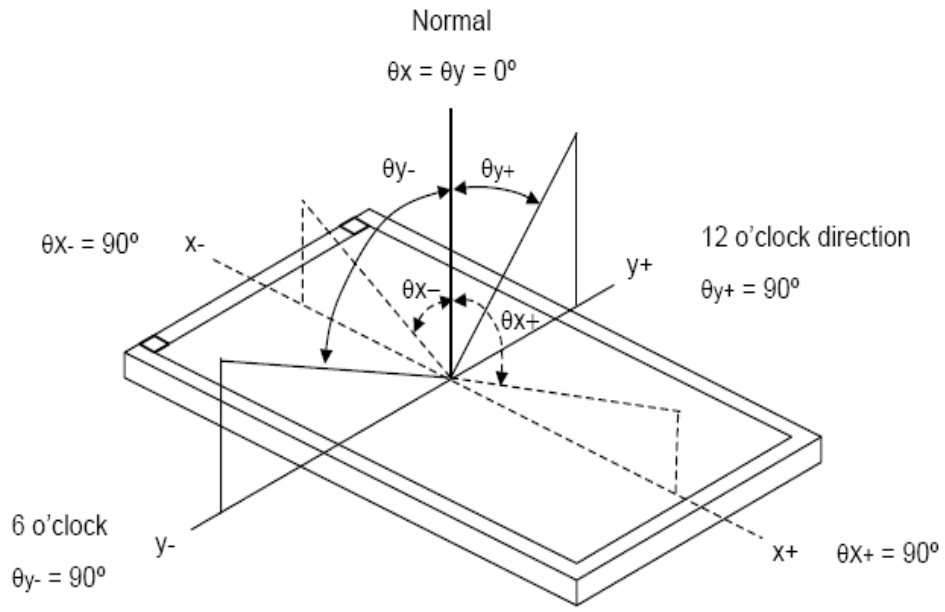
Fig. 4 Reverse scan (pin 17, reLR = High, pin 18, reUD = High)

3.0 OPTICAL SPECIFICATION

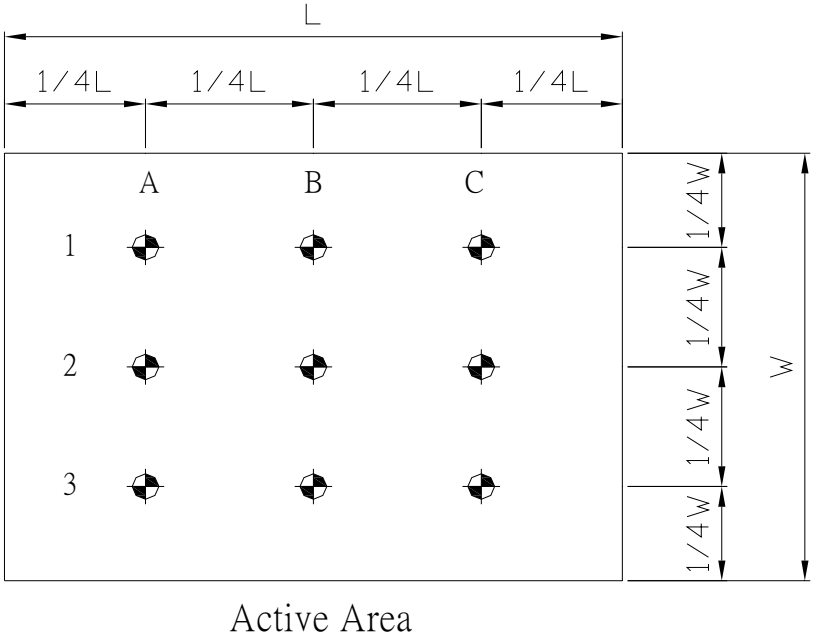
Item		Symbol	Condition	Data	Unit	Note
Color chromaticity	**Red**	**Rx**	**θx=0 θy=0 BM-7**	0.6244	-	Test Mode：(**1**)(**2**)(**3**)
		Ry		0.3606	-	
	Green	**Gx**		0.3109	-	
		Gy		0.6211	-	
	Blue	**Bx**		0.1424	-	
		By		0.0851	-	
	White	**Wx**		0.2919	-	
		Wy		0.3258	-	
Center Luminance of White		**Lc**		1000	**cd/㎡**	
Uniform		**Lu**		80	%	
Contrast Ratio		**CR**	**θx=0 θy=0 Klein K-10**	700:1	-	Test Mode：(**1**)(**4**)
Color Saturation		**NTSC**		68	%	
Viewing Angle	**Horizontal**	**θx+**	**CR≧10**	80	**Deg**	Test Mode：(**1**)(**3**)
		θx-		80		
	Vertical	**θy+**		70		
		θy-		70		

Test Mode：

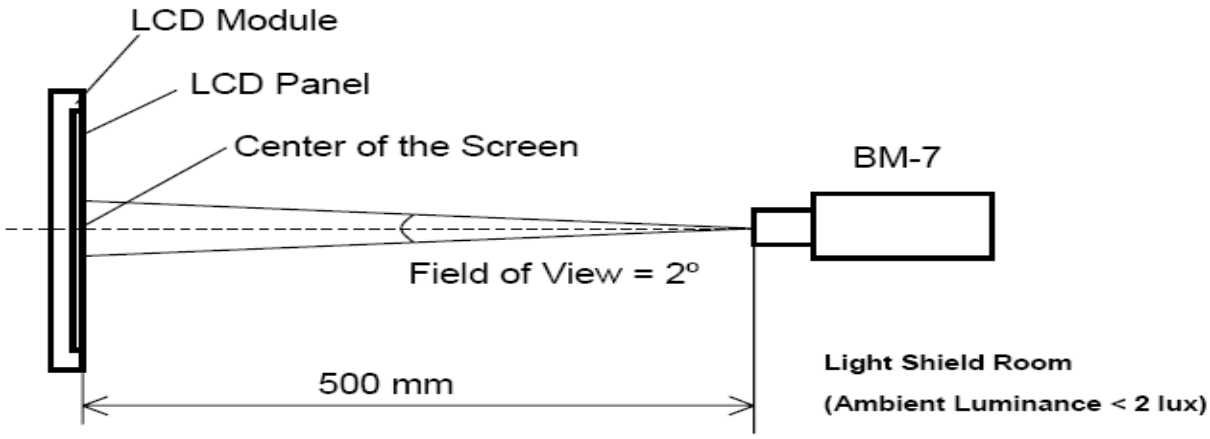
（**1**） Definition of Viewing Angle（θx，θy）：



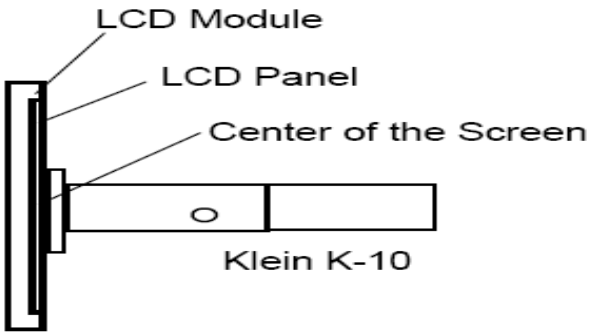
（**2**） Definition of Test Point：



（**3**）**BM-7** Measurement Setup**:**



（**4**）**Klein K-10** Measurement Setup**:**



4.0 LED DRIVING BOARD SPECIFICATIONS

1. LED Application

This specification is applied to LED converter unit for DLF/DLH1236 V2(1000 nits) LED backlight

2. Operating Characteristics

Item	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remark
Input Voltage	Vin		10.0	12.0	14.0	V	
Input Current (Low Brightness)	IinL	VIN=12V,Vadj=5V	3	-----	-----	mA	
Input Current (High Brightness)	IinH	VIN=12V,Vadj=0V	0.762	0.633	0.544	A	
LED Current (Low Brightness)	IoutL	VIN=12V,Vadj=5V	0.0	-----	-----	Arms	
LED Current (High Brightness)	IoutH	VIN=12V,Vadj=0V	0.3	0.3	0.3	A	
Working Frequency	Freq	VIN=12V,Vadj=0V	900	1000	1100	KHz	
PWM Frequency	Freq	VIN=12V	180	200	220	HZ	
Brightness Control	Vadj	Connection of Voltage	0.5	-----	4.8	V	
ON/OFF Control	Von/off	Normal Operation	2	-----	5	V	
Output Voltage	Vout	VIN=12V,Vadj=0V	22.217	22.217	22.217	V	
Efficiency	η	VIN=12V,Vadj=0V	87.81	87.74	87.51	%	

3. Connector Socket

3-1. Input Connector: J3(JST S 8B-PH-SM3-TB or Compatible)

:

PIN No	Symbol	Description
1	Vin	DC+12V
2	Vin	DC+12V
3	Vin	DC+12V
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	Brightness	Brightness Control 5V~0V
8	Control	ON/OFF Control 0.8V(OFF) 2~5V(ON)

3-2. Output Connector: J1,J2(JST S 2B-ZR-SM3A-TF or Compatible)

:

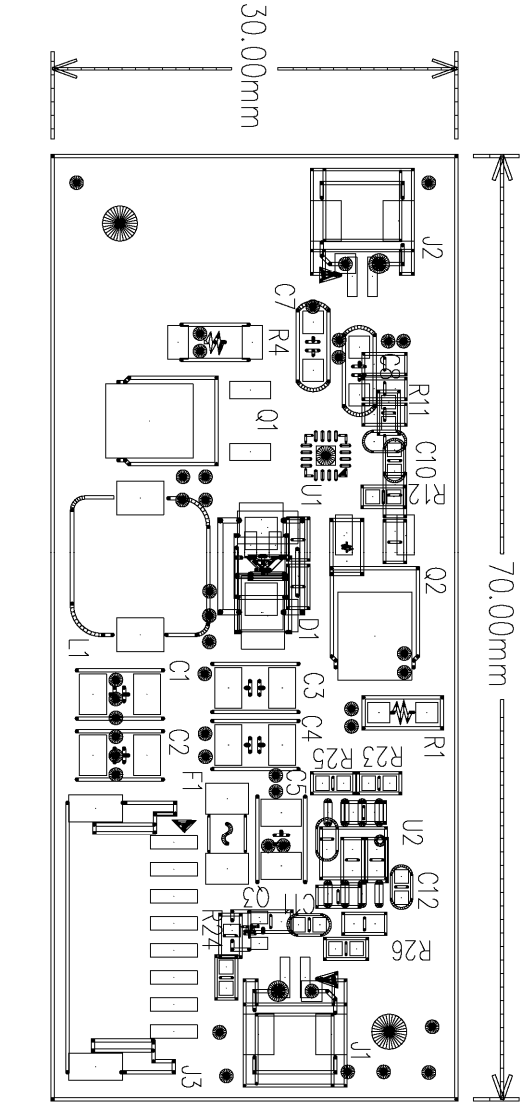
PIN NO	Symbol	Description
1	Output	LED High Voltage(+)
2	Output	LED Low Voltage (-)

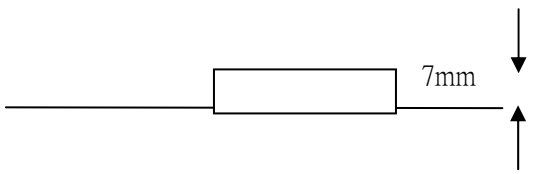
4. Mechanical Characteristics

Dimension: 70mm*30mm*7mm

INPUT CONNECTOR
J3:

PIN1:VIN
PIN2:VIN
PIN3:VIN
PIN4:GND
PIN5:GND
PIN6GND
PIN7:BRIGHTNESS
PIN8:ON/OFF





5.0 AD6038GD SPECIFICATIONS (DLH1236 V2 only)

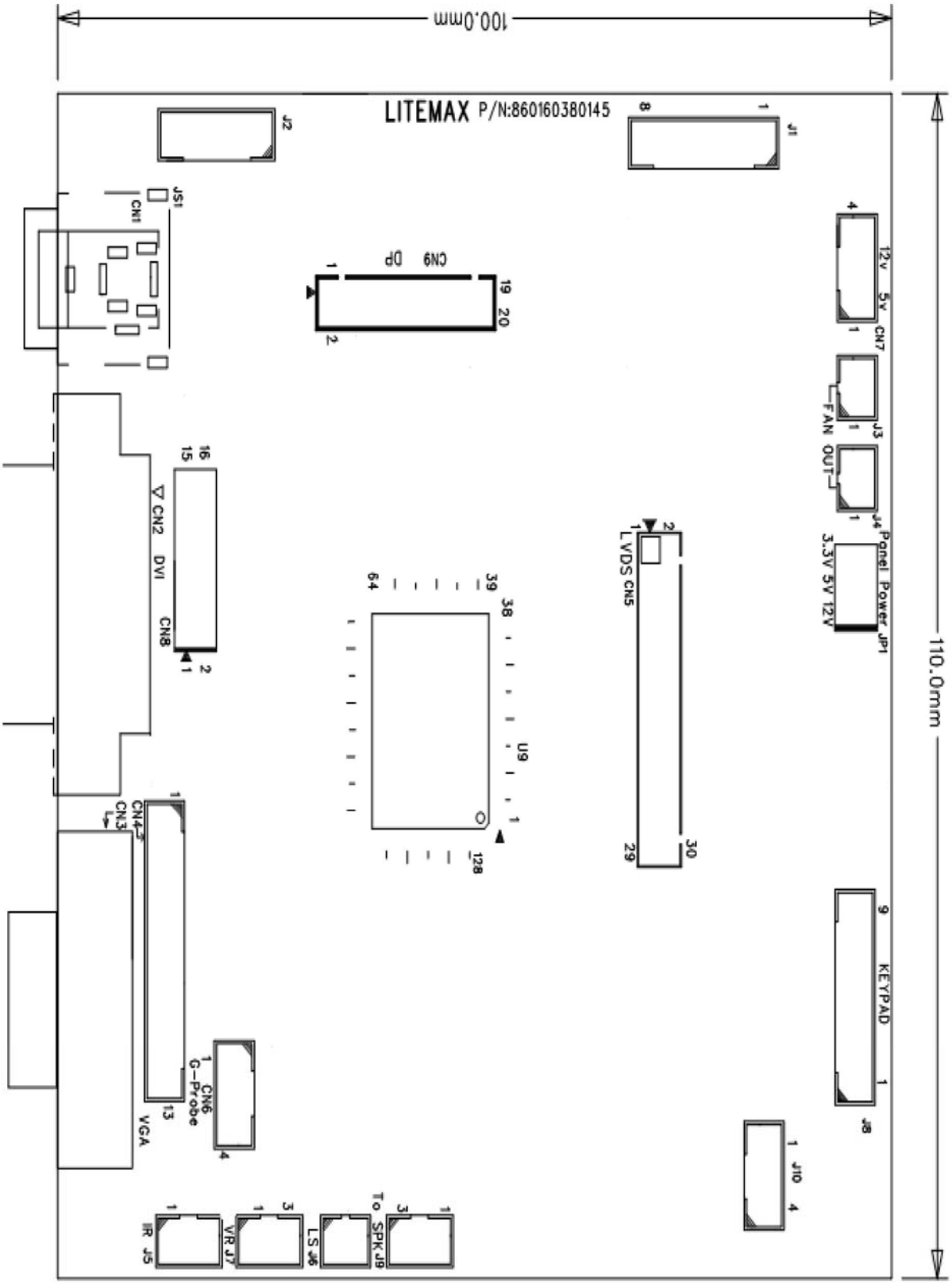
We developed this A/D board to support industrial high brightness and commercial applications. This A/D board has many functions. It has a display port and DVI-D input. Rev.1 is European RoHS compliant.

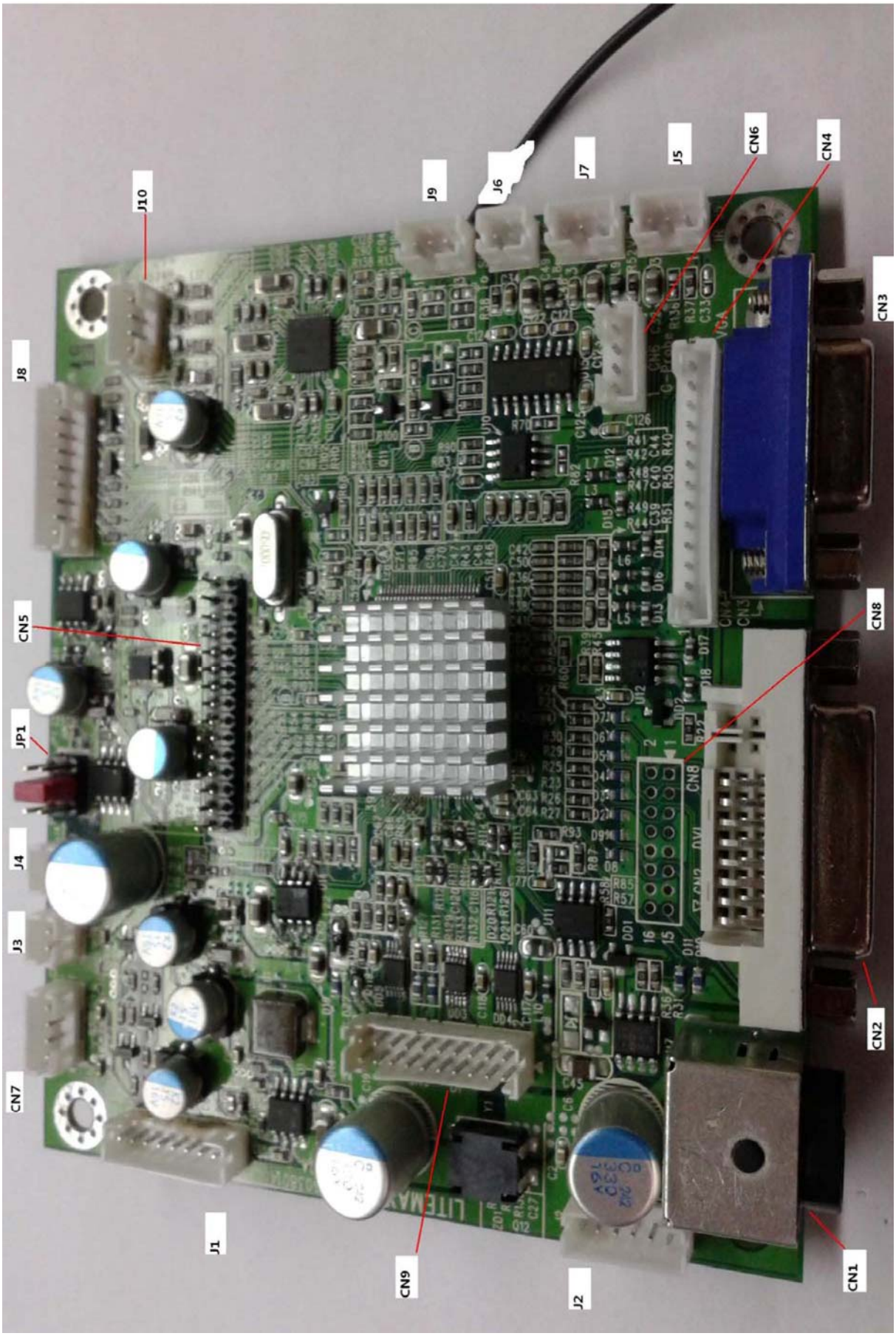
General Description

- Max Resolution Up To WUXGA+
- Analog RGB Input up to 205MHz
- ULTRA-RELIABLE DVI-D INPUT
- Dual/single LVDS interface
- Support Panel DC5V or 12V,3.3V Output
- OSD Control
- Inverter Analog or PWM Dimming Control.
- *External RS232 control (optional)
- Input Power 12Vdc
- Display port input. (Support display port 1.1a)
- Audio in and 5Wx2 Audio Out(optional)
- *External V.R. brightness control (optional)
- *External light sensor brightness control (optional)
- *External IR control (optional)
- External Fan Control by Software

Outline Dimensions

AD6038 110mmX100mm




J10
J9
J6
J7
J5
CN6
CN4
CN3
J8
CN5
JP1
J4
J3
CN7
CN8
CN2
J1
CN9
J2
CN1

AD6038 Board Pin Define

CN5: Panel connector

Pin No.	Function	Pin No.	Function
1	RxO0-	16	RxE1+
2	RxO0+	17	RxE2-
3	RxO1-	18	RxE2+
4	RxO1+	19	RxEC-
5	RxO2-	20	RxEC+
6	RxO2+	21	RxE3-
7	RxOC-	22	RxE3+
8	RxOC+	23	GND
9	RxO3-	24	GND
10	RxO3+	25	GND
11	GND	26	GND
12	GND	27	NC
13	RxE0-	28	PANEL-VCC
14	RxE0+	29	PANEL-VCC
15	RxE1-	30	PANEL-VCC

CN2: DVI-D INPUT Connector

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2/4 Shield	11	T.M.D.S Data1/3 Shield	19	T.M.D.S. Data0/5 Shield
4	T.M.D.S. Data4-	12	T.M.D.S. Data3-	20	T.M.D.S. Data5-
5	T.M.D.S. Data4+	13	T.M.D.S. Data3+	21	T.M.D.S. Data5+
6	DDC Clock	14	+5V Power	22	T.M.D.S. Clock Shield
7	DDC Data	15	Ground (for +5V)	23	T.M.D.S. Clock+
8	Vertical SYNC.	16	Hot Plug Detect	24	T.M.D.S. Clock-

CN8: DVI-D Connector (16pin 2.0mm)

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	RX2-	7	DDC_SDA	13	GND
2	RX2+	8	DDC_SCL	14	GND
3	RX1-	9	GND	15	DVI HP
4	RX1+	10	GND	16	DVI_5V
5	RX0-	11	RXC-		
6	RX0+	12	RXC+		

CN9: DISPLAY PORT

Pin No.	Function	Pin No.	Function
1	DPRX3-	11	DPRX0-
2	DPRX3+	12	DPRX0+
3	DPRX2-	13	GND
4	DPRX2+	14	GND
5	GND	15	DPAUX-
6	GND	16	DPAUX+
7	DPRX1-	17	GND
8	DPRX1+	18	Hot plug detect
9	GND	19	GND
10	GND	20	DP +5V

CN3: Analog RGB Input connector (D-SUB 15Pin)

Pin	Symbol	Description	Pin No.	Symbol	Description
1	RED	Analog Red	9	+5V	+5VDDC
2	GREEN	Analog Green	10	SGND	Sync GND
3	BLUE	Analog Blue	11	NCD	Reserved
4	GND	Reserved	12	SDA	DDC Serial Data
5	GND	VGA_CAB	13	HSYNC	Horizontal Sync
6	RED_RTN	Red Return	14	VSYNC	Vertical Sync
7	GREEN_RTN	Green Return	15	SCL	DDC Data Clock
8	BLUE_RTN	Blue Return			

CN4: Analog RGB Input connector (13pin connector)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	SDA	DDC Serial Data	8	GREEN	Analog Green
2	SCL	DDC Data Clock	9	GREEN_RTN	Green Return
3	GND	Reserved	10	BLUE	Analog Blue
4	+5V	+5VDDC	11	BLUE_RTN	Blue Return
5	GND	Reserved	12	VSYNC	Vertical Sync
6	RED	Analog Red	13	HSYNC	Horizontal Sync
7	RED_RTN	Red Return			

CN1: Power Jack (12V)

Pin No.	Function	Pin No.	Function
1	12VDC	2	12VDC
3	GND	4	GND

J2: Power connector (12V) (4PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	12VDC	2	12VDC
3	12VDC	4	GND
5	GND	6	GND

CN7: Touch Power connector

Pin No.	Function	Pin No.	Function
1	5V	2	GND
3	12V	4	GND

J1: Inverter Connector(8PIN 2.0mm)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	ON/OFF	Backlight ON/OFF	5	GND	GND
2	BRIGHT	Dimming adjust	6	12VDC	Input 12VDC
3	GND	GND	7	12VDC	Input 12VDC
4	GND	GND	8	12VDC	Input 12VDC

J4, J3: Fan control (2PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	12V	2	GND

J8: Key Pad (9PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	POWER KEY	6	MENU KEY
2	GREEN LED	7	AUTO KEY
3	RED LED	8	GND
4	DOWN KEY	9	GND
5	UP KEY		

JP1: Panel Power

Pin No.	Function	Pin No.	Function
1-2 3-4	12VDC 5V	5-6	3.3V

CN6: RS232 Connector

Pin No.	Function	Pin No.	Function
1 3	5v UART RX	2 4	UART TX GND

J9: Audio connector (3PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	GND	2	AUDIO-L
3	AUDIO-R		

J10: Speaker Connector (4PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	SPK_R+	2	SPK_R-
3	SPK_L-	4	SPK_L+

J7: VR connector (3PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	3,3VDC	2	VR Out
3	GND		

J6: Ambient (2PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1	3.3VDC	2	Sensor Out

J5: IR connector (3PIN 2.0mm)

Pin No.	Function	Pin No.	Function
1 3	IR IR VCC	2	GND

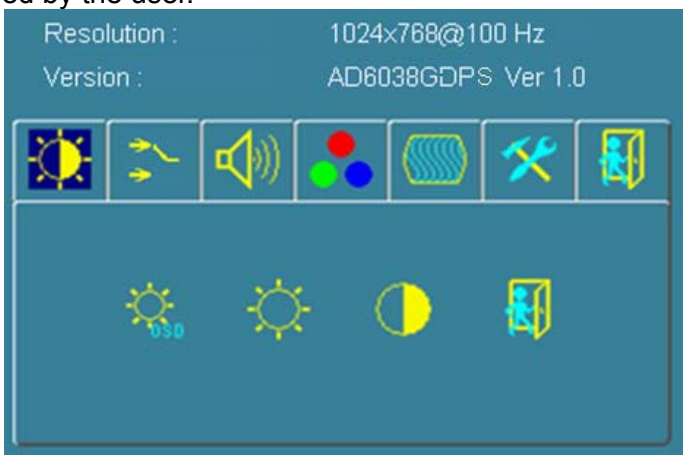
DC Characteristics.

Power Consumption	10W	Note1
Operation Temperature	0~70	℃
Storage Temperature	-20~85	℃

Note: These values are for the A/D board body.

OSD menu

By pressing the “menu” button, you will see the below picture. Across from timing you will see resolution, frequency, and V-frequency of the panel. Version shows the firmware control version. These cannot be altered by the user.



There are 7 sub menus within the OSD user interface:
Brightness, Signal Select, Sound, Color, Image, Tools, and Exit.

When you press the “menu” button, you enter the “Brightness” sub directory. In this directory, you will see 4 selections:

press ’’right’’ key, you can go into the **OSD Brightness**.

OSD Brightness：

Press the “menu” once, to adjust the brightness. Press “left” to dim down the brightness to “0”, press “right” to increase the brightness to “100”

Contrast：

Press “menu” and “right” buttons to adjust the contrast from “0” to “100”. To adjust from “100” to “0”, press “menu” and the “left” buttons.

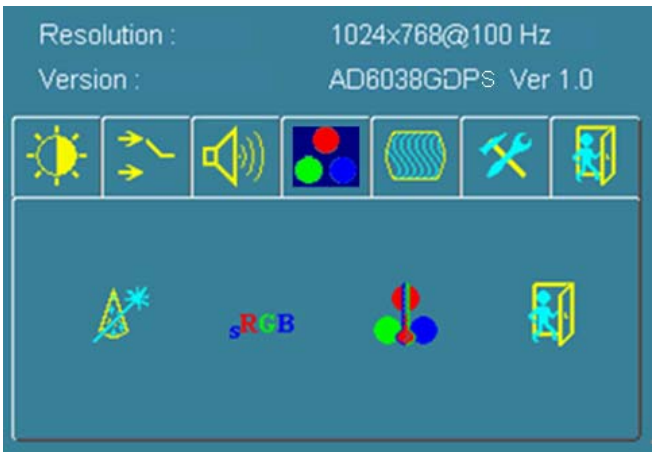
Exit: back to the beginning menu.

VGA **Analog:** RGB/VGA input

DVI **Digital:** DVI input

DP **DP:** DisplayPort input

Exit **Exit:** back to the beginning menu.



Auto Color：By navigating over to the “Auto Color” option, optimal color performance is invoked.

SRGB: Windows standard color setting

Color Temperature: You have 4 options in this selection

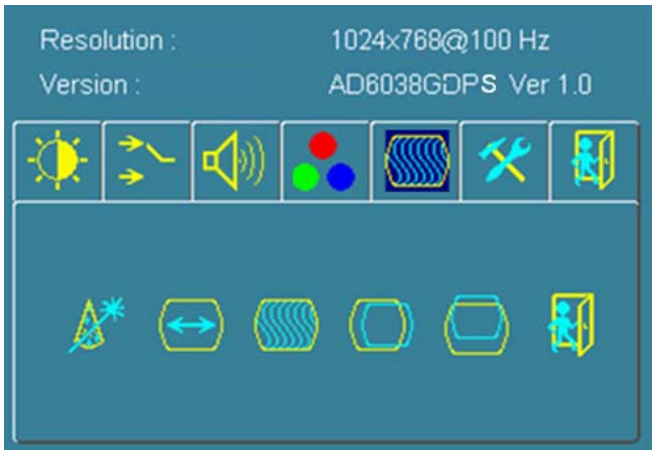
.

Color Temperature User Define: Default is 100 for “R”, “G”, and “B”.

Color Tempture_6500K: Warm color scheme

Color Tempture_93OOK: Cold color scheme

Exit: back to the beginning menu.



Auto Adjust:

Choose this option and the AD6038 will adjust to the optimal horizontal and vertical frequency.

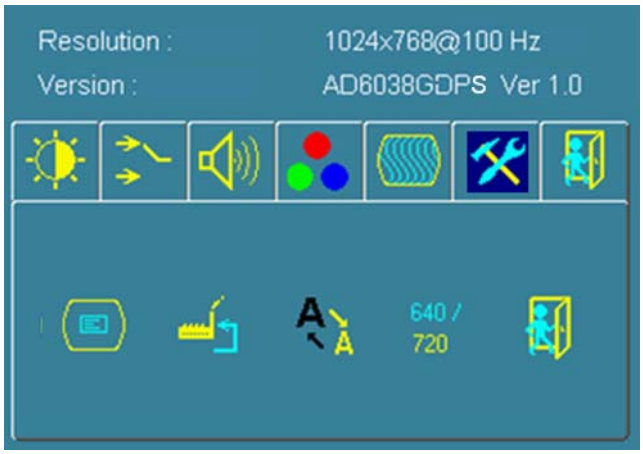
Clock: If you are not satisfied with the Auto tune result, you can adjust manually by pressing “Clock”. Using this will make the image wider.

Phase: If “double images” appear around the characters, choose “Phase” to remove them..

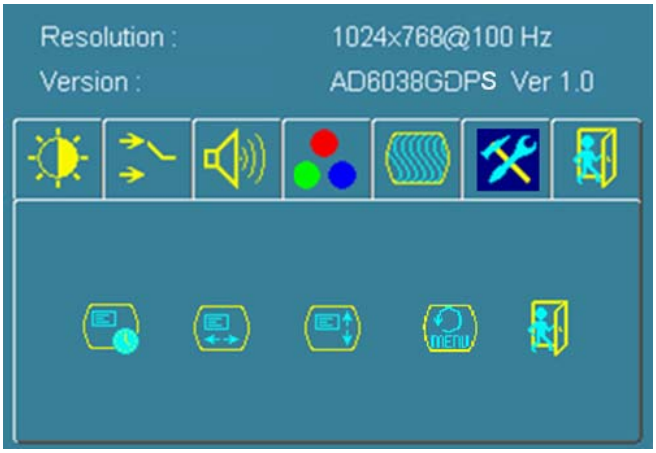
HPos: You can shift the screen horizontally using this function.

Vpos: You can shift the screen vertically using this function.

Exit: back to the beginning menu.



OSD Control: Selecting this option, brings you to 5 more options:



Osd_time: Select time for the OSD user interface to stay on screen, for 2 sec. to 16 sec. Default is 6 sec.

Osd_HPos: Moves the OSD user interface horizontally on screen.

Osd_VPos: Moves the OSD user interface vertically on screen.

Osd_Rotation: Rotates the OSD user interface Rotation(0˚/90˚/180˚/270˚) on screen.

Exit: You can exit this sub menu back to the beginning

Factory_Reset: By pressing this, the screen will revert to factory settings, and the previous settings will be deleted.

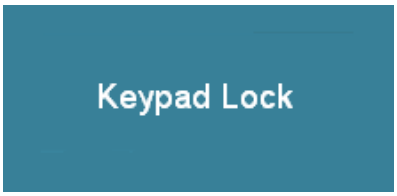
Sharpness: Sharpen characters.

Dos_mode/Gxf_mode: For some old programs which use 640x400 and 720x400 (DOS Mode and graphics mode), This option needs to be selected manually.

Exit: back to the normal screen

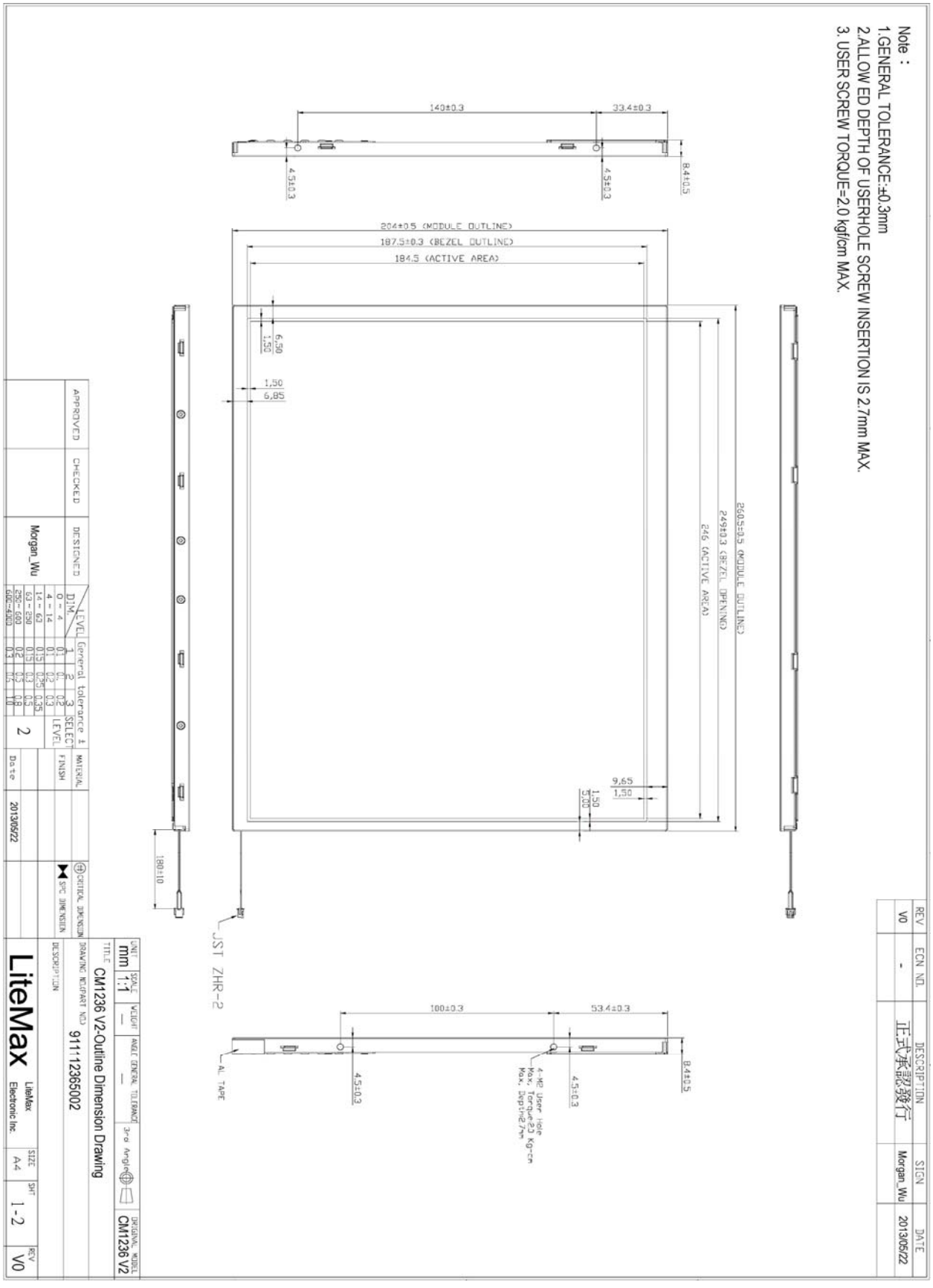
OSD Lock Function：

It is possible to lock all the OSD buttons to prevent unauthorized changes to occur by pressing “**Left <**” and “**right >**” and “**Menu**” buttons simultaneously. You will see the “lock” icon below on the center of the screen for 3 ~ 6 seconds. If any button is pushed after the lock function is initiated, the below icon will appear on the screen.'



To release the OSD lock, press “**Left <**” and “**right >**” and “**Menu**”. The below icon will appear on the center of the screen for 3 ~ 6 seconds. Now all OSD keys are active again.

6.0 MECHANICAL DRAWING



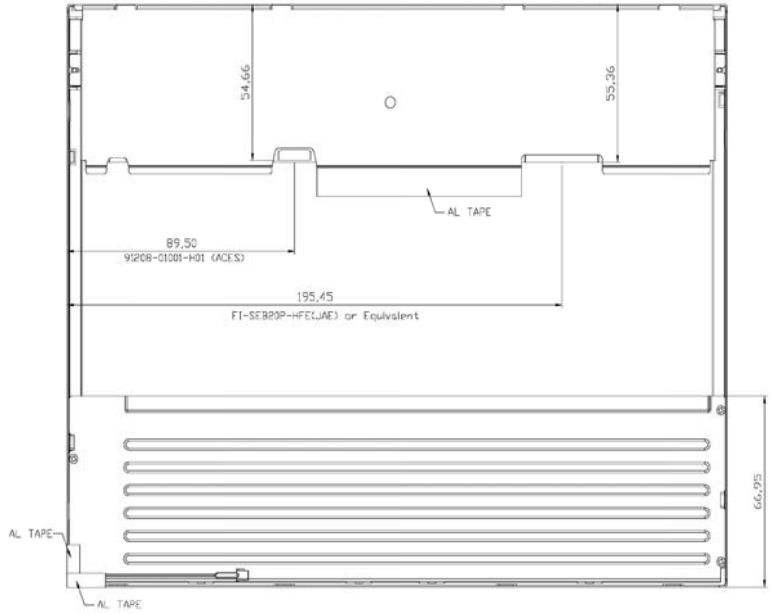
REV	ECN NO.	DESCRIPTION	SIGN	DATE
V0	-	正式承認發行	Morgan_Wu	2013/05/22

Note：

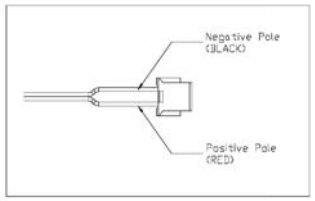
1.GENERAL TOLERANCE:±0.3mm

2.ALLOW ED DEPTH OF USERHOLE SCREW INSERTION IS 2.7mm MAX.

3. USER SCREW TORQUE=2.0 kgf/cm MAX.



DETAL:



UNIT	SCALE	WEIGHT	ANGLE GENERAL TOLERANCE		ORIGINAL MODEL
mm	1:1	—	—	3rd Angle	CM1236 V2

TITLE: CM1236 V2-Outline Dimension Drawing

DRAWING NO(PART NO.): 911112365002

DESCRIPTION:

APPROVED	CHECKED	DESIGNED
		Morgan_Wu

LEVEL / DIM.	General tolerance ± 1	2	3
0 ~ 4	0.1	0.1	0.2
4 ~ 14	0.1	0.2	0.3
14 ~ 63	0.15	0.25	0.35
63 ~ 250	0.15	0.3	0.5
250 ~ 600	0.2	0.5	0.8
600~4200	0.3	0.6	1.0

SELECT LEVEL: 2

MATERIAL		CRITICAL DIMENSION
FINISH		SPC DIMENSION
Date	2013/05/22	

LiteMax LiteMax Electronic Inc.

SIZE	SHT	REV
A4	2-2	V0

7.0 PRECAUTIONS

HANDLING PRECAUTIONS

(1) The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.
(2) While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.
(3) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.
(4) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.
(5) If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.
(6) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.
(7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.
(8) Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.
(9) Do not disassemble the module.
(10) Do not pull or fold the lamp wire.
(11) Pins of I/F connector should not be touched directly with bare hands.

STORAGE PRECAUTIONS

(1) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.
(2) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.
(3) It may reduce the display quality if the ambient temperature is lower than 10 ºC. For example, the response time will become slowly, and the starting voltage of lamp will be higher than the room temperature.

OPERATION PRECAUTIONS

(1) Do not pull the I/F connector in or out while the module is operating.
(2) Always follow the correct power on/off sequence when LCD module is connecting and operating. This can prevent the CMOS LSI chips from damage during latch-up.